

# **PATENT**

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## **CORD RETAINER**

### **Background of the Invention**

The present invention relates to a new and improved cord retainer  
which may be utilized in association with a portable electrical device having a  
5 cord.

A portable electrical device, that is, a hand held electrical device which  
is capable of being easily carried and transported, may have a cord which  
tends to become tangled and/or interfere with movement of the electrical  
device. It has previously been suggested that cords on portable electrical  
10 devices can be held by reel assemblies in the manner disclosed in U.S. Patent  
Application Publication No. 2002/0137554 A1 and in United Kingdom  
Published Patent Application No. 2 351 485 A.

When a cord reel, similar to the cord reels in the aforementioned  
published patent applications, is used in association with a portable electrical

device, the cord reel projects from the device. The projecting cord reel is bulky and tends to interfere with the portability of the electrical device. In addition, the projecting cord reel is detrimental to having a compact electrical device which can be readily used.

### **Summary of the Invention**

5           The present invention relates to a new and improved cord retainer for use with a portable electrical device having a cord. The cord retainer is compact and is effective to store a cord without interfering with carrying and use of the electrical device. The cord retainer may have a flange which is connected with a housing of the electrical device and which at least partially  
10       defines a groove into which the cord may be manually wound.

          The cord retainer may be fixedly connected with a housing for the portable electrical device. Alternatively, the cord retainer may be movable between a retracted position in which the cord retainer is at least partially enclosed by the housing for the portable electrical device and an extended  
15       position in which the cord retainer extends outward from the housing. The cord retainer may have a recess which receives a component of the portable electrical device.

          It is contemplated that a cord retainer constructed in accordance with the present invention will be utilized in association with many different types  
20       of portable electrical devices. The cord retainer may be particularly

advantageous when utilized in association with a cellular phone. However, it should be understood that the cord retainer may be utilized in association with other portable electrical devices, such as disc players, digital music players, and/ or radios.

### **Brief Description of the Drawings**

5           The foregoing and other features of the present invention will become more apparent upon a consideration of the following description taken in connection with the accompanying drawings wherein:

Fig. 1 is a schematic front plan view of a portable electrical device;

Fig. 2 is a schematic rear plan view of the portable electrical device of

10       Fig. 1 and illustrating the manner in which a cord retainer constructed in accordance with the present invention is connected with the electrical device;

Fig. 3 is a schematic side elevational view, taken generally along the line 3-3 of Fig. 2, further illustrating the relationship between the cord retainer and the electrical device;

15           Fig. 4 is an enlarged top pictorial illustration of the cord retainer of Figs. 2 and 3;

Fig. 5 is a side pictorial illustration of the cord retainer of Figs. 2 and 3;

Fig. 6 is a bottom pictorial illustration of the cord retainer of Figs. 2 and 3;

Fig. 7 is a fragmentary schematic pictorial illustration depicting the manner in which the cord retainer of Figs. 4 – 6 may be integrally formed as one piece with the electrical device of Figs. 1 – 3;

5 Fig. 8 is a schematic side elevational view of an embodiment of a cord retainer having inner and outer flanges;

Fig. 9 is a fragmentary schematic pictorial illustration depicting the manner in which the cord retainer may be mounted for movement between extended and retracted positions; and

10 Fig. 10 is a fragmentary schematic pictorial illustration, generally similar to Fig. 9, of another embodiment of the cord retainer.

### **Description of Specific Preferred Embodiments of the Invention**

A known portable electrical device 10 is illustrated in Fig. 1. Although the portable electrical device 10 is a cellular phone, it should be understood  
15 that the cellular phone is representative of many different known types of portable electrical devices. For example, the portable electrical device may be a disc player, digital music player, or radio.

The cellular phone 10 includes a housing 12 having a front side 14 and a rear side 16 (Figs. 2 and 3). A key pad 20, speaker 22, microphone 24 and  
20 display 26 (Fig. 1) are disposed on the front side 14 of the housing 12. It should be understood that the cellular phone 10 may have any one of many

known constructions. The specific cellular telephone 10 illustrated in Figs. 1 – 3 is merely representative of many different known cellular telephones.

5 A cord retainer 32 (Figs. 2 and 3), constructed in accordance with the present invention, is mounted on the rear side 16 of the housing 12. The cord retainer 32 is integrally formed of a single piece of molded polymeric material. However, if desired the cord retainer 32 could be formed of a plurality of pieces of polymeric material or of another material, such as metal.

10 The cord retainer 32 at least partially defines a groove 34 (Fig. 3) into which a cord may be manually wound to store the cord. The cord may have any one of many known constructions. For example, the cord may be similar to the cord disclosed in U.S. Patent Application Publication No. 2002/0137554 A1.

15 A first end of the cord may be connected with an outlet on the portable electrical device 10 or inserted into a notch or recess 38 (Fig. 2) in the cord retainer 32. The cord is manually grasped and wound around the cord retainer 32. As this occurs, a plurality of turns are formed in the cord around the cord retainer 32 to at least partially fill the groove 34 with the electrical cord. The cord retainer 32 does not move relative to the housing 12 as the cord is wound around the cord retainer. The second end of the cord may  
20 then be secured by inserting it into a second notch or recess 40 in the cord retainer 32. The stored cord and cord retainer 32 projects for a relatively

small distance from the housing 12 and does not destroy the compact construction and portability of the cellular phone 10.

In the specific embodiment of the cord retainer 32 illustrated in Figs. 2 and 3, there are two notches 38 and 40 in the cord retainer. However, a  
5 greater or lesser number of notches may be provided if desired. For example, four notches or recesses, having the same configuration as the notches 38 and 40, may be formed in the cord retainer 32. This would enable the portion of the free end of the cord to be relatively close to a notch into which the cord is inserted. Of course, an even greater number of notches may be  
10 provided in the cord retainer 32 if desired.

It is contemplated that the notches 38 and 40 may be omitted and the cord secured to the cord retainer 32 only by winding the cord in the groove 34. If desired, the groove 34 may be provided with a partially restricted entrance to retard movement of the cord from the groove. If the notches 38  
15 and 40 are omitted, clips may be used to further hold the cord in the groove 34. These clips may be connected with the cord retainer 32 or may be separate from the cord retainer.

The cord retainer 32 is fixedly connected with the housing 12. A releasable fastener, specifically "dual lock" (trademark) reclosable fastener, is  
20 utilized to fixedly connect the cord retainer 32 with the housing 12. "Dual lock" (trademark) reclosable fastener is commercially available from Minnesota Mining and Manufacturing Company (aka 3M) of Saint Paul,

Minnesota. "Dual lock" (trademark) reclosable fastener has been described as polypropylene reclosable fastener which includes a rubber based pressure sensitive adhesive with 170 to 400 stems per square inch, black foam adhesive, and white polyethylene film liner. The fastener may be black  
5 and/or clear.

Other known types of fasteners may be utilized to fixedly connect the cord retainer 32 with the housing 12. For example, one or more screws or similar type fastener may be utilized. Alternatively, a single layer of adhesive may be utilized to connect the cord retainer 32 with the housing 12. If  
10 desired, a hook and loop type fastener, such as "velcro" (trademark), may be used to fixedly connect the cord retainer 32 to the housing 12. Regardless of what type of fastener is used, the cord retainer 32 is held in a stationary relationship with the housing 12 by the fastener.

When a releasable fastener, such as "dual lock" (trademark) or "velcro" (trademark), is utilized to fixedly connect the cord retainer 32 to the housing  
15 12, the cord retainer may be easily disconnected from the housing. This enables an individual using the portable electrical device 10 to easily disconnect the cord retainer 32 from the housing 12. Once the cord retainer 32 has been disconnected from the housing 12, the use of a releasable  
20 fastener enables the cord retainer 32 to be easily reconnected to the housing.

The cord retainer 32 has an oval configuration. However, if desired, the cord retainer 32 may have a different configuration, such as a circular

configuration. It is believed that the illustrated oval configuration of the cord  
retainer 32 may be preferred. This is because the oval configuration of the  
cord retainer 32 tends to maximize the length of the oval groove 34. This  
tends to maximize the length of cord which will be disposed in each turn of  
5 the cord around the cord retainer 32.

If the cord retainer 32 is constructed with a circular configuration, the  
length or circumference of the annular groove may be less than the length of  
the oval groove 34. Therefore, more turns of the cord would have to be  
made around the cord retainer in order to store the cord in the groove 34.

10 However, if the housing 12 has a square configuration, rather than the  
illustrated rectangular configuration, it may be preferred to utilize a cord  
retainer 32 having a circular configuration.

### **Cord Retainer**

The construction of the cord retainer 32 is illustrated in Figs. 4 through  
15 6. The cord retainer 32 is integrally formed as one piece of molded polymeric  
material. The cord retainer 32 includes a base portion 46 and a plate portion  
48 (Figs. 4 – 6). If desired, the base portion 46 and plate portion 48 may be  
formed separately and interconnected with one or more fasteners.

The base portion 46 and plate portion 48 both have an oval  
20 configuration. However, the plate portion 48 extends beyond the base  
portion 46 to form a flange 50. As is perhaps best seen in Fig. 3, the flange



50 has an inner side surface which cooperates with the rear side 16 of the housing 12 and the base portion 46 to form the groove 34.

Since the plate portion 48 has an oval configuration which corresponds to the oval configuration of the base portion 46, the flange 50 extends  
5 outward from the base portion 46 by substantially the same distance throughout the extent of the flange. This results in the groove 34 (Fig. 3) having the same depth throughout its extent. Therefore, turns of the cord which are wrapped around the base portion 46 can be firmly gripped between the flange 50 and the rear side 16 of the housing 12 throughout the extent of  
10 the groove 34.

The oval base portion 46 has parallel side surfaces 51 and 52 (Fig. 6). The side surfaces 51 and 52 are interconnected by arcuate end surfaces 53 and 55. The flange 50 has the same configuration as the base portion 46. When the cord is wrapped around the cord retainer 32, turns of the cord are  
15 pressed against the side surfaces 51 and 52 and the end surfaces 53 and 55 on the base portion 46. In addition, turns of the cord engage the inner side of the flange 50 and the rear side 16 of the housing 12. The cord retainer 32 is stationary relative to the housing 12 as the cord is manually wound around the cord retainer.

20 A recess 54 (Fig. 6) is formed in the base portion 46 to receive a fastener formed by a strip of material. The fastener may include a first strip of adhesive which bonds or secures to the flat inner side surface of the recess

54. The fastener may have a second or outer strip of adhesive. A removable covering strip may be provided on the second or outer strip of adhesive to prevent it from bonding to objects other than the rear side 16 of the housing 12. If a reclosable fastener, such as "dual lock" (trademark) is utilized, a portion of the reclosable fastener would be positioned in the recess 54.

The depth of the recess 54 will depend upon the thickness of the fastener utilized. If a single layer of adhesive is used as the fastener, the recess 54 will be shallow. If a multiple layered fastener, such as "dual lock" (trademark) or "velcro" (trademark), is utilized, the recess 54 will be relatively deep.

If a fastener which is not formed as a strip is utilized, the recess 54 may be eliminated. Thus, if screws or similar devices are utilized to attach the cord retainer 32 to the housing 12, the recess 54 may be omitted.

Alternatively, a screw type fastener and adhesive may both be utilized to connect the cord retainer 32 with the housing 12. If this is done, the recess 54 would be provided to receive the adhesive.

### **Integral Retainer and Housing**

In the embodiment of the invention illustrated in Figs. 1 – 6, the cord retainer 32 is integrally formed as one piece which is separate from the housing 12. However, in the embodiment of the invention illustrated in Fig. 7, the cord retainer is integrally formed as one piece with the housing. Since

components of the embodiment of the invention illustrated in Fig. 7 are similar to components of the embodiment of the invention illustrated in Figs. 1 – 6, similar numerals will be utilized to designate similar components. The suffix letter "a" being added to the numerals of Fig. 7 to avoid confusion.

5           A portable electrical device 10a (Fig. 7) includes a housing 12a having a front side 14a and a rear side 16a. In the embodiment of the invention illustrated in Fig. 7, the portable electrical device is a cellular telephone. Therefore, a keypad 20a is disposed on the front side 14a of the housing 12a. It should be understood that the portable electrical device may be a device  
10           other than a cellular phone.

          A cord retainer 32a includes a base portion 46a and a plate portion 48a. The plate portion 48a extends outward from the base portion 46a to form a flange 50a. The flange 50a cooperates with the rear side 16a of the housing 12a to form a groove 34a into which a cord may be manually wound.

15           In accordance with a feature of this embodiment of the invention, the cord retainer 32a is integrally formed as one piece with the housing 12a. Thus, the cord retainer 32a and housing 12a are integrally molded as one piece of polymeric material. Although the cord retainer 32a is formed as one piece with the housing 12a, it should be understood that the cord retainer  
20           32a has the same configuration as the cord retainer 32 of Figs. 4 – 6. Of course, there is no recess, corresponding to the recess 54 of Fig. 6, in the base portion 46a of the cord retainer 32a of Fig. 7.

The base 46a of the cord retainer 32a is solid. However, the base of the cord retainer may be hollow. If the base 46a of the cord retainer 46a is hollow, an opening may be provided in the housing 12a to enable components of the portable electrical device 10a to be disposed in a cavity in the cord retainer.

### **Cord Retainer-Two Flanges**

In the embodiments of the invention illustrated in Figs. 1 – 7, the cord retainer 32 has a single flange 50 which cooperates with the rear side 16 of the housing 12 to form the groove 34. In the embodiment of the invention illustrated in Fig. 8, the cord retainer is provided with two flanges which at least partially define a groove in which the cord is received. Since the embodiment of the invention illustrated in Fig. 8 is generally similar to the embodiments of the invention illustrated in Figs. 1 – 7, similar numerals will be utilized to identify similar components, the suffix letter “b” being added to the numerals associated with Fig. 8 in order to avoid confusion.

A cord retainer 32b (Fig. 8) includes a base portion 46b and an outer plate portion 48b. The outer plate portion 48b extends outward from the base portion 46b to form a flange 50b. The base portion 46b and plate portion 48b have the same configuration as the base portion 46 and plate portion 48 of the embodiment of the invention illustrated in Figs. 4 – 6. A

notch or recess 38b for receiving an end portion of a cord is provided in the plate portion 48b.

In accordance with a feature of the embodiment of the invention illustrated in Fig. 8, the cord retainer 32b includes a second plate portion 60.

5 The plate portion 60 extends outward from the base portion 46b to form a second flange 62. The plate portion 60 extends generally parallel to the plate portion 48b. Therefore, the flanges 62 and 50b extend generally parallel to each other. However, the inner flange 62 is tapered to form a smooth junction with a housing on a portable electrical device.

10 The plate portions 48b and 60 of the cord retainer 32b are integrally formed as one piece with the base portion 46b. Thus, the base portion 46b, plate portion 48b and plate portion 60 are formed as a single piece of molded polymeric material. However, if desired either or both of the plate portions 48b and 60 may be formed separately from the base portion 46b.

15 A fastener 66 is disposed in a recess formed in the flange 60. The fastener 66 is formed by a strip of material. The illustrated fastener 66 is a reclosable fastener, specifically, "dual lock" (trademark). However, the fastener 66 may have a different construction if desired. For example, the fastener 66 may be formed of a suitable adhesive. If the fastener 66 is  
20 formed of adhesive, a releasable cover strip may be provided on the outside of the adhesive. The fastener 66 holds the cord retainer 32a against movement relative to a housing of a portable electrical device.

By forming the cord retainer 32b with a pair of flanges 50b and 62, the groove 34b is formed between the flanges. When the cord is manually wound in the groove 34b, little or no force is applied by the cord against the housing of the portable electrical device to which the cord retainer 32b is  
5 fixedly connected. Therefore, there is little or no force tending to loosen the connection formed between the cord retainer 32b and the housing of the portable or electrical device by the fastener 66.

### **Operation**

When the cord retainer 32 is to be connected with a housing 12 of an  
10 electrical device 10, a protective covering layer is removed from a fastener disposed in the recess 54 in the base of the cord retainer 32. The cord retainer 32 is then fixedly secured to the rear side 16 of the housing 12 of the portable electrical device 10. The connection between the cord retainer 32 and the rear side 16 of the housing 12 holds the cord retainer against  
15 movement relative to the housing.

When a cord associated with the cellular telephone 10 is to be stored in the groove 34, the cord may be disconnected from or left in engagement with an outlet 72 (Fig. 3) formed in the portable electrical device 10. If the cord remains in engagement with the outlet 72, the free portion of the cord is  
20 wrapped around the base 46 of the cord retainer 32. The portion of the cord

adjacent to the free end of the cord is then inserted into the notch or groove 38 or 40.

Regardless of whether or not the cord retainer 32 is formed separately from the housing 12 or is integrally formed as one piece with the housing, the cord retainer is relatively compact. This is because the base portion 46 of the  
5 cord retainer projects a relatively small distance outward from the rear side 16 of the housing 12. Due to the oval configuration of the cord retainer, a relatively long length of the cord is wound around the base portion of the cord retainer with each turn of the cord in the groove 34. Therefore, the cord  
10 can be easily wound around the stationary cord retainer 32 by manually winding a plurality of turns of the cord around the base portion 46 of the cord retainer.

The cord which is stored with the cord retainer 32 may be for any one of many desired purposes. For example, an earplug may be disposed at one  
15 end portion of the cord and the opposite end portion may have a jack for an outlet 72. Of course, the cord can be for other purposes if desired. The cord may be disconnected from the outlet 72 before being wound around the cord retainer 32. Alternatively, the cord may be wound around the retainer 32 while the cord is still connected to the outlet 72.

20 Although the cord retainer 32 has been described herein in association with a specific portable electrical device 10, that is, in association with a cellular phone, it is contemplated that the cord retainer may be utilized with

other types of portable electrical devices. For example, the cord retainer 32 may be associated with a portable disc player, digital music player, or with a radio.

### **Movable Cord Retainer**

5           In the embodiment of the invention illustrated in Figs. 1 – 6, the cord retainer 32 is fixedly connected to the portable electrical device 10. In the embodiment of the invention illustrated in Fig. 9, the cord retainer is movable relative to the portable electrical device. Since the embodiment of the invention illustrated in Fig. 9 is generally similar to the embodiments of the invention illustrated in Figs. 1 – 8, similar numerals will be utilized to  
10           designate similar components, the suffix letter “c” being associated with the numerals of Fig. 9 to avoid confusion.

          A portable electrical device 10c (Fig. 9) includes a housing 12c having a front side 14c and rear side 16c. In the embodiment of the invention  
15           illustrated in Fig. 9, the portable electrical device 10c is a cellular telephone. Therefore, a keypad 20c is disposed on the front side 14c of the housing 12c. It should be understood that the portable electrical device may be a device other than a cellular telephone.

          A cord retainer 32c includes a base portion 46c and a plate portion  
20           48c. The plate portion 48c extends outward from the base portion 46c to form a flange 50c. The flange 50c cooperates with the rear side 16c of the



housing 12c to form a groove 34c into which a cord may be manually wound. The cord retainer 32c is integrally formed as one piece of molded polymeric material. However, the cord retainer 32c may be formed as a plurality of interconnected pieces if desired.

5           In accordance with a feature of this embodiment of the invention, the cord retainer 32c is movable relative to the housing 12c. The cord retainer 32c is illustrated in fig. 9 in an extended position relative to the housing 12c. When the cord has been removed from the groove 34c, the cord retainer 32c may be manually moved to the left (as viewed in Fig. 9) relative to the  
10           housing 12c. This results in the base 46c of the cord retainer 32c moving into a cavity 72 formed in the portable electrical device 10c.

          As the base 46c moves into the cavity 72, the plate portion 48c moves into a recess 74 formed in the rear side 16c of the housing 12c. The recess 74 has a configuration which corresponds to the configuration of the plate  
15           portion 48c. Therefore, when the cord retainer 32c has been moved from the extended position illustrated in Fig. 9 to its retracted position, an outer surface 76 on the plate portion 48c is aligned with the outer side surface of the rear side 16c of the housing 12c. This results in the retracted cord  
20           retainer 32c being flush with the exterior of the housing 12c to thereby minimize the overall size of the portable electrical device 10c.

          When the cord retainer 32c is to be pulled from its retracted position back to its extended position, a tab (not shown) on the plate portion 48c may

be manually grasped and the cord retainer pulled outward toward the extended position. Rather than providing a tab on the flange portion 48c, a manually engagable recess may be provided on the flange portion 48c to enable an individual utilizing the portable electrical device 10c to pull the cord  
5 retainer 32c outward from the housing 12d. Alternatively, a manually engagable D-ring may be pivotally mounted on the plate portion 48d.

As the cord retainer 32c is pulled outward from the retracted position toward the extended position, retainer tabs 82 and 84 on the base 46c of the cord retainer 32c slide along linear grooves 86 and 88 formed in the housing  
10 12c. When the cord retainer 32c reaches the extended position illustrated in Fig. 9, the retainer tabs 82 and 84 engage stop surfaces formed on the housing 12c to limit outward movement of the cord retainer 32c.

In accordance with another feature of the embodiment of the invention illustrated in Fig. 9, the base 46c of the cord retainer 32c is hollow. This  
15 results in the base 46c of the cord retainer 32c having a recess or cavity 92 which may receive a component 94 of the portable electrical device 10c when the cord retainer 32c is in its retracted position. To form the recess 92, the base 46c of the cord retainer 32c has a side wall 94 with an oval cross  
sectional configuration as viewed in a plane extending parallel to the plate  
20 portion 46c. The oval configuration of the side wall 94 corresponds to the oval configuration of the plate portion 48c. The oval configuration of the

plate portion 48c is the same as the oval configuration of the plate portion 48 of Figs. 2 – 6.

Since the side wall 94 has an oval configuration, as viewed on a plane extending parallel to the flange portion 48c, the recess 92 also has an oval configuration. If desired, the component 94 of the portable electrical device 10c may have an oval configuration which corresponds to the oval configuration of the recess 92. It should be understood that the cord retainer 32c may have a configuration other than the illustrated oval configuration. For example, the cord retainer 32c may have a circular configuration.

It should be understood that the component 94 of the electrical device 10c has been illustrated schematically in Fig. 9 and may be any one of many different components of the portable electrical device 10c. For example, the component 94 may be a battery. Alternatively, the component 94 may include a printed circuit board on which a plurality of solid state devices are mounted. Of course, other components of the portable electrical device 10c may be positioned in the cavity 72.

When the cord retainer 32c is in the retracted position with the plate portion 48c disposed in the recess 74, the component 94 is disposed in the recess 92 in the cord retainer 32c. Thus, when the cord retainer 32c is in the retracted position, the side wall 94 of the cord retainer 32c extends around the component 94. By having the component 94 disposed in the cord retainer 32c when the cord retainer is in the retracted position, the compact

construction of the portable electrical device 10c is maintained even though cord retainer 32c has moved into the housing 12c when the cord retainer is in the retracted position.

When a cord is to be manually wound around the cord retainer 32c,  
5 the cord retainer is moved from the retracted position to the extended position illustrated in Fig. 9. As the cord retainer 32c moves from the retracted position to the extended position, the retaining tabs 82 and 84 slide along the linear grooves 86 and 88 to guide movement of the cord retainer 32c. In addition, the sidewall 94 engages a side surface 98 of an opening in  
10 the housing 12c to further guide the movement of the cord retainer 32c. Therefore, the cord retainer 32c is moved along a straight path from the retracted position to the extended position.

As the cord retainer 32c moves to the extended position, the side wall 94 of the cord retainer is moved toward the right (as viewed in Fig. 9) relative  
15 to the component 94 of the portable electrical device 10c. In the illustrated embodiment of the invention, the component 94 is fixedly connected with the housing 12c and does not move outward with the cord retainer 32c. However, if desired, the component 94 may be connected with the cord  
retainer 32c so that the component remains in the recess 92 in the cord  
20 retainer 32c as the cord retainer is moved from the retracted position to the extended position. Of course, a portion of the component 94 may be mounted in the recess 92 for movement with the cord retainer 32c and

another portion of the component 94 may be connected with the housing 12c and remain stationary relative to the housing as the cord retainer 32c is pulled outward to the extended position of Fig. 9.

5        Once the cord retainer 32c is moved to the extended position of Fig. 9, a cord may be manually wound around the cord retainer in the manner previously explained in conjunction with the embodiments of the invention illustrated in Figs. 1 – 8. As the cord is wound around the extended cord retainer 32c, a portion of one or more turns of the cord move into the recess 74 as the cord is wrapped around the side wall 94. In addition, the turns of  
10       the cord press against the flange 50c. The turns of the cord are held between the plate portion 48c of the cord retainer 32 and the rear side surface 16c which partially defines the recess 74. As the cord is manually wound around the side wall 94 of the cord retainer 32c, the cord retainer is stationary relative to the housing 12c.

15       **Movable Cord Retainer-  
Second Embodiment**

      In the embodiment of the cord retainer illustrated in Fig. 9, the base portion 46c of the cord retainer 32c includes a continuous oval side wall 94. In the embodiment of the invention illustrated in Fig. 10, the continuous oval  
20       side wall is eliminated and the base is formed by a plurality of support sections or legs. Since the embodiment of the invention illustrated in Fig. 10 is generally similar to the embodiments of the invention illustrated in Figs. 1 –

9, similar numerals will be utilized to designate similar components, the suffix letter "d" being associated with the numerals of Fig. 10 to avoid confusion.

A portable electrical device 10d (Fig. 10) includes a housing 12d having a front side 14d and a rear side 16d. In the embodiment of the invention  
5 illustrated in Fig. 10, the portable electrical device 10d is a cellular telephone. Therefore, a keypad 20d is disposed on the front side 14d of the housing 12d. It should be understood that the portable electrical device 10d may be a device other than a cellular telephone. For example, the portable electrical device 10d may be a compact disc player or a radio.

10 The cord retainer 32d includes a base portion 46d and a plate portion 48d. The plate portion 48d extends outward from the base portion 46d to form a flange 50d. The flange 50d cooperates with the rear side 16d of the housing 12d to form a groove 34d into which a cord may be manually wound. The cord retainer 32d is integrally formed as one piece of molded polymeric  
15 material. However, the cord retainer 32d may be formed as a plurality of interconnected pieces if desired.

In accordance with a feature of this embodiment of the invention, the cord retainer 32d is movable relative to the housing 12d. The cord retainer 32d is illustrated in Fig. 10 in an extended position relative to the housing  
20 12d. When the cord has been removed from the groove 34d, the cord retainer 32d may be manually moved to the left (as viewed in Fig. 10) relative

to the housing 12d. This results in the base 46d of the cord retainer 32d moving into a cavity 72d formed in the portable electrical device 10d.

As the base 46d moves into the cavity 72d, the plate portion 48d moves into a recess 74d in the rear side 16d of the housing 12d. The recess

5 74d has a configuration which corresponds to the configuration of the plate portion 48d. Therefore, when the cord retainer 32d has been moved from the extended position illustrated in Fig. 10 to its retracted position, an outer surface 76d on the plate portion 78d is aligned with the outer surface of the rear side 16d of the housing 12d. This results in the retracted cord retainer  
10 32d being flush with the exterior of the housing 12d thereby minimizing the overall size of the portable electrical device 10d.

When the cord retainer 32d is to be pulled from its retracted position back to its extended position, a tab (not shown) on the plate portion 48d may be manually grasped and the cord retainer pulled outward toward the  
15 extended position. Rather than pulling a tab on the flange portion 48d, a manually engagable recess may be provided in the flange portion to enable an individual utilizing the portable electrical device 10d to pull the cord retainer 32d outward from the housing 12d. Alternatively, a manually engagable D-ring may be pivotally mounted on the plate portion 48d.

20 As the cord retainer 32d is pulled outward from the retracted position toward the extended position, retainer tabs 82d and 84d on the base 46d of the cord retainer 32d slide along linear grooves 86d and 88d formed in the

housing 12d. When the cord retainer 32d reaches the extended position illustrated in Fig. 9, the retainer tabs 82d and 84d engage stop surfaces formed on the housing 12d to limit outward movement of the cord retainer 32d.

5           In accordance with a feature of the embodiment of the invention illustrated in Fig. 10, the base 46d of the cord retainer 32d is formed by a pair of support sections or legs 102 and 104. This results in the base 46d of the cord retainer 32d having a recess 92d which may receive a component 94d of the electrical device 10d when the cord retainer is in its retracted position. In  
10           the illustrated embodiment of the invention, the support sections 102 and 104 are arcuate panels having a configuration corresponding to the configuration of the arcuate end surfaces 53 and 55 of the cord retainer 32 of Fig. 6. It should be understood that the cord retainer 32d may have a configuration other than the illustrated oval configuration. For example, the cord retainer  
15           32d may have a circular configuration.

          The relatively small extent of the support sections 102 and 104, compared to the extent of the side wall 94 of Fig. 9, enables the cord retainer 32d to be moved to the retracted position with the cord retainer in a minimum of space in the cavity 72d. This maximizes the space available for  
20           the component 94d of the electrical device 10d. As was previously mentioned, the component 94d may be a battery and/or printed circuit board



with a solid state electronic devices thereon. Of course, other components of the portable electric device 10d may be positioned in the cavity 72d.

When the cord retainer 32d is in the retracted position with a plate portion 48d disposed in the recess 74d, the component 94d is disposed  
5 between the support sections 102 and 104 of the cord retainer 32d. Thus, when the cord retainer 32d is in the retracted position, the support sections 102 and 104 of the cord retainer are disposed in the cavity 72d adjacent to opposite ends of the component 94d. By constructing the base portion 46d of the cord retainer 32d with the pair of spaced apart support sections 102 and  
10 104, the available space in the cavity 72d for the component 94d tends to be maximized and the compact construction of portable electrical device 10d is facilitated.

When a cord is to be manually wound around the cord retainer 32d, the cord retainer is moved from the retracted position, to the extended  
15 position illustrated in Fig. 10. As the cord retainer 32d moves from the retracted position to the extended position, the retainer tabs 82d and 84d slide along the linear grooves 86d and 88d to guide movement of the cord retainer 32d. In addition, the support sections 102 and 104 engage side surfaces 98d of openings in the housing 12d to further guide movement of  
20 the cord retainer 32d. Therefore, the cord retainer 32d is moved along a straight path from the retracted position to the extended position.

As the cord retainer 32d moves to the extended position, the plate portion 48d and support sections 102 and 104 of the cord retainer are moved toward the right (as viewed in Fig. 10) relative to the component 94 of the portable electrical device 10d. Once the cord retainer 32d is moved to the  
5 extended position of Fig. 10, the cord may be manually wound around the cord retainer in the manner previously explained in conjunction with the embodiments of the invention illustrated in Figs. 1 – 9. As the cord is wound around the extended retainer 32d, a portion of one or more turns of the cord move into the recess 74d as the cord is wrapped in the groove 34d around  
10 the support sections 102 and 104. In addition, the turns of the cord press against the flange 50d. The turns of the cord are held between the plate portion 48d of the cord retainer 32d and the rear side surface 16d which partially defines the recess 74d. As the cord is manually wound around the support sections 102 and 104 of the cord retainer 32d, the cord retainer is  
15 stationary relative to the housing 12d.

### **Conclusion**

In view of the foregoing description, it is apparent that the present invention relates to a new and improved cord retainer 32 for use with a portable electrical device 10 having a cord. The cord retainer 32 is compact  
20 and is effective to store a cord without interfering with carrying and use of the electrical device 10. The cord retainer may have a flange 50 which is

connected with a housing 12 of the electrical device and which at least partially defines a groove 34 into which the cord may be manually wound.

5 The cord retainer 32 may be fixedly connected with the housing 12 for the portable electrical device 10. Alternatively, the cord retainer 32 may be movable between a retracted position in which the cord retainer is at least partially enclosed by the housing 12 for the portable electrical device 10 and an extended position in which the cord retainer extends outward from the housing (see Figs. 9 and 10). The cord retainer 32 may have a recess 92 which receives a component 94 of the portable electrical device.

10 It is contemplated that the cord retainer 32 constructed in accordance with the present invention will be utilized in association with many different types of portable electrical devices. The cord retainer 32 may be particularly advantageous when utilized in association with a cellular phone 10. However, it should be understood that the cord retainer may be utilized in association  
15 with other portable electrical devices such as disc players, digital music players, and/or radios.